Abstract

The process of economic liberalisation in India has allowed free imports of technology and goods This has led to intense competition and shorter Product Life Cycles (PLC) This situation has brought about a greater need for marketing to have differentiated programmes across different phases of the life cycle of a product These effects of liberalisation have been particularly evident in Indian industrial goods organisations The need for continuous product and process oriented technological developments is being felt by the marketers, in these organisations, in order to obtain sustainable competitive benefits throughout the PLC

A review of literature indicated that technological developments would be different across the life cycle phases matching business strategies and marketing programmes But it appears that there are no comprehensive studies relating to this issue Therefore, such a study is attempted in this thesis to understand the relationship between marketing programmes and technological developments across different phases of the PLC This would be useful in an organisation for matching its efforts for technological developments with the needs of marketing

Based on the the author's observations in a preliminary study, discussions held with

experts in the area and a relevant literature review, the following objectives have been set out for the study

1 To make a general descriptive analysis of the marketing programmes and technological developments

2 To identify variables of marketing programmes and technological developments which are dominant in discriminating between the different phases of the PLC And to generate and test a set of hypotheses

3 To establish and study the nature of the relationship between marketing programmes and technological developments at each phase of the PLC and to test the relevant hypothesis

Technological Development (**TD**) is defined as changes affected in the products and processes of a firm Marketing Programme (**MP**) is defined as a set of decisions about the elements of the marketing mix like product offering, place, price, and promotion, which are subject to managerial control

A cross-sectional survey design has been adopted to conduct the study, following earlier studies Based on earlier research studies twenty-eight variables of marketing programmes were identified On the suggestions given by the experts in the preliminary study, and through a pilot study, the marketing variables relevant to the four phases of the PLC were short-listed Twenty-one technological development variables were identified and listed from literature

A field study of sixty-three organisations in the Indian general purpose machinery manufacturing sector was conducted using a specially developed questionnaire in

dimensions and machining

(ii) Between Growth and Maturity phases MP variables - price manipulations, product line changes and feature additions TD variables - scale variants, quality, features, scale of production and value additions

iii)Between Maturity and Decline phases MP variables - re-tailoring products, differentiation by price and marketing expenditures TD variables - scale variants, range of use, measurements and sequence of operations

Hypotheses regarding the difference in the levels of the MP and TD variables (generated in (2) above) that are dominant in discriminating between pairs of phases of the PLC have been tested The results revealed importance of the different MP and TD variables in different PLC phases (two-sample t test)

3) MMP variables were significantly associated with the various dimensions of TD in each phase of the PLC and thus, support the Hypothesis that MP variables are associated to dimensions of TD in each PLC' phase

A sample of the results of the regression analyses between the MP variables and TD dimensions are presented below **(The TD dimensions which are the dependent variables are highlighted)**

i) In the Introduction Phase

The **Variants** dimension is associated with determining products' physical performance **Appearance** and Process Planning dimensions with product attribute determination **Utility** dimension with need determination in existing markets and need determination in new markets and **Process Control** dimension is associated

which the variables were rated on a Likert-type five-point scale Data, pertaining to one hundred and ninety one products in four phases of the PLC, was collected using the questionnaire, through face-to-face interviews

A **descriptive analysis** was done in order to get a general picture of the MP and TD developments in different phases of the PLC A **discriminant analysis** was performed to get dominant variables of MP and TD that discriminate between each pair of phases of the PLC In all **twenty one hypotheses** were formulated Nineteen of them were based on the dominant variables obtained from the discriminant analysis and tested using **two sample *t*-tests** for the level of these variables across the different PLC phases A factor analysis was performed on the TD variables to get the dimensions of technological developments at each phase of the PLC Finally several **multiple regression** analyses were carried out for the relationships between variables of MP and TD dimensions in each phase of the PLC

Results of the study revealed that -

1) The set of MP variables and the set of TD variables emphasised at each PLC phase was unique (descriptive analysis)

2) Results of the discriminant analyses support the hypothesis that there will be a unique set of TD variables that will discriminate between different phases of the PLC Also sets of MP and TD variables that are dominant in discriminating between pairs of phases of the PLC were obtained as follows

i)Between Introduction and Growth phases MP variables - need determination in existing markets and marketing expenditures TD variables - reliability, features,

with product-in use studies

ii) In the Growth Phase

The **Quality** dimension is associated with determining products' physical performance **Variants** dimension is associated with product line changes, geographical expansions and adding complementary Products

iii) In the Maturity Phase

The **Variants** dimension is associated with feature additions, sales force efforts and differentiation by price The **Appearance** dimension is associated with re-tailoring products **Process Control** is associated with differentiation by price, product modifications by process changes and service improvements

iv) In the Decline phase

Variants dimension is associated with product line changes The dimension of **Appearance** is associated with product line changes and differentiation by promotions **Modifications** is associated with sales force efforts and re-tailoring products and **Process Control** dimension is associated with differentiation by price

Summing up, the results show that in different PLC situations different dimensions of technological developments are associated with different marketing programme variables From the point of view of business strategy for organisations where technology is the life-blood, the results of the study are helpful in avoiding wasteful allocation of resources, in the marketing and technology functions and help in synergetic planning of these two functions for achieving of overall business goals